Keeping your enemies closer – strategies of knowledge transfer at the East German Filmfabrik Wolfen

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Keeping Your Enemies Closer:
Strategies of Knowledge Transfer at the East German Filmfabrik Wolfen

Hello everyone,

I am delighted to be here today to talk about the strategies and circumstances of knowledge transfer that have accompanied the technical, cultural and institutional history of the chromogenic color film stocks Agfacolor and Orwocolor. In the framework of my dissertation project, I aim to decode the contexts in which these color film processes evolved and the conditions under which the company in Wolfen operated. "Keeping your enemies closer. Stategies of knowledge transfer at the East German Filmfabrik Wolfen" is thus a part of my bigger basic research into Agfacolor's and Orwocolor's transnational identity construction as material artifacts on the one hand and as cultural products on the other hand. This investigation is based on a qualitative analysis of a heterogenous corpus of contemporary film and non-film sources.

This perspective is also reflected in this paper. I will talk about:

- Selected patterns of knowledge transfer and quality control at the East German Filmfabrik Wolfen.
- Furthermore, I am going to present a sub-corpus of my sources that informed the presented assumptions.

One of my key assumptions is that transnational processes of observation and exchange have affected the development of color film stocks, especially after World War II, during the period of the so-called Cold War. The term "observing" refers to the protagonists (for instance companies, scientists, other employees) and their transfer of knowledge about color film stock production, because or despite political and ideological agendas.

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Just a few words about my research object, the chromogenic monopack: The process is characterized by the formation of dyes during the film's development. The colors are produced by means of dye-couplers. These color-forming substances are either embedded in several different layers in the emulsion (Agfacolor and Eastman Color) or added during film development (Kodachrome). Amongst other things, their composition is responsible for the specific look of a film stock and represents a critical issue for color film producers who must

decide which path they want to follow for their own products; f.ex. to provoke a realistic or enhanced look.

These dye-couplers and their patents are hence the basis for trading and exchange. Understanding their composition can lead you on the path of its derivation (protagonists, companies belonging).

Why should we, in the humanities in general, and in film studies specifically, bother with this complex chemical/technological aspect of color film stock production?

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First of all, because the traditional historiography of such processes is oftentimes written by experts in chemistry or physics. And those experts were frequently part of the same company system that longed for new inventions and innovations, mainly for economic reasons. That means, that they were qualified to talk about the topics they knew (technology) and, at the same time, only considered those factors that seemed to be most promising and important in terms of the decision making process in color film stock production. The results are technical monographs dealing with film color processes in chronological order and addressing mostly teleological perspectives. As you see, many of them were published between the 1970s and 1990s.

Jack H. Coote summarizes the state of affairs in 1993 as follows:

(→4) I quote:

"There have been several more recent histories, by Sipley in the US, Coe in the UK, and Koshofer in Germany, all of which make use of plentiful illustrations in colour. However, …, none of these works is a detailed technical history although they are perhaps the more easily read because of that."

And he continues by explaining the allegedly unique und new stance of his book:

"It seemed to me therefore that there is now a place for a new history, dealing in a fairly detailed manner with the technicalities of photographic colour processes and emphasizing the part that mechanical and electronic engineering have played along the way."

(End of quotation.)

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Roderick T. Ryan wrote such a monograph even before Coote, concentrating chiefly on technical conditions of color film stock production. But he also tried to defend his America-centric perspective on those developments. 25 years after the introduction of Eastman Color from Kodak, Ryan indeed recognized the efforts of non-American competitors, though excluding all the processes that could not establish themselves on the US market.

Speaking of European and Asian Color film stocks, Ryan accentuates their role for the American production companies while attributing their success to their high ability of adaptation to American standards.

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The aforementioned monographs link the development of chromogenic film stock only to economic and commercial factors. To standardize and adapt a product to existing requirements would have been the highest goal for a company. Quality and price are the exclusive driving forces in this system. But why quality did not always succeed is another question as the example of Agfa/ORWO shows.

If “History is written by victors.”, This seems to be the case for the chromogenic monopack, too.

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But before I proceed, let me locate the city of Wolfen for you. **(→)** It was the headquarter of the Agfa plant, built in 1909 and continued the film stock production almost immediately after World War II for the Socialist nations. From the end of the 1940s until 1964, the newly constructed film production plant in Leverkusen and the old one in Wolfen coexisted under the same name “Agfa”. In 1964, Wolfen sold all the rights for the Agfa brand to Leverkusen and changed the company’s name to ORWO, which is an acronym for “ORiginal WOlfen”

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In 1945, before the Russians arrived in East Germany to take over and implement a socialist regime, the American “Combined Intelligence Objectives Sub-Committee” (CIOS) and the “British Intelligence Objectives Sub-Committee” (BIOS), put all the technological secrets from Agfa on record and therefore promoted their subsequent use.

And this is what happened afterwards…

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The patents (and former secrets) spread. **(→)** For example, from Wolfen in Germany to Ferrania in Italy, Schostka in Ukraine, Binghamton in the United States and Tokyo in Japan. In this animated map, you can see how the transfer of knowledge affected the global color film stock production over time.

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But not only the Agfacolor patents spread in this manner. **(→)** Only a few years later, in 1950 Kodak introduced their next big thing with the even more popular Eastman Color negative 5247. Those patents went on a transnational world tour as well. From their American collaborator Technicolor to Fujifilm in Japan, and also to Germany, but not only to the newly constructed Agfa plant in West Germany, but also to the East. To Wolfen. Where all those red arrows started.

Now, how do we know that those patents influenced the production of the later called ORWO plant if their products never showed any signs for Kodak patents until the late 1980s? Because we find evidence for this in their research records.

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I have collected a considerable number of documents that illustrate the scientific research going on in secrecy at the Agfa/ORWO plant in Wolfen and behind the so-called Iron curtain. The parts of history that are often left aside are coincidences and unsuccessful inventions. Wolfen had a lot of the second category. Because as those records show, they failed big time when it came to improving their products in comparison to international contemporary standards.

How do I know about these research records? Luckily, there is a big treasure trove in the archival holdings of the Industry and Film museum Wolfen. The stored documents are neither complete nor digitized but as soon I got the archivist's trust, I had access to another gem: **(→12)** the index card system. After the German reunification, they created these flashcards for inventory reasons. So, instead of just asking specific questions about persons and film stocks, I decided to scan all index cards from the departments that were familiar with the production of color film such as the research and development, emulsion and also customer service.

(→13) The cards contain themselves lots of information.

(→14) As for example about the research department, the topic of research, staff involved, the date, respectively the period of publication. Besides that, the archive also used tags to group the research records according to specific recurring topics.

(→15) And these index cards lead us to the documents behind…

(→16) Which are research records like this one.

(→17) With the actual information about executed analysis methods, film stocks and components involved and the results of these steps. This is accompanied by a summary, references to former research done in that field and a general evaluation of the investigations carried out on that topic.

With the help of all these potential sources in mind, I can focus on a particular research interest such as mechanisms of quality control and the transfer of knowledge in that area.

In order to measure the quality of a product, there are different approaches. Besides that, the derivation of quality features is never executed within a political or societal vacuum but stems from processes of comparison and transfer. Nicolas Le Guern has pointed out, I quote **(→18)**:

"In industrial research, and in the field of photographic research in particular, two opposite fundamental practices control the management of knowledge: secrecy and transfer of knowledge." End of quote.

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This was also the case for the East German film production plant. Wolfen dedicated itself to the topic of quality in almost every field of work. Most obviously, debates on the nature of the products were held in the **(→20)** Technical Control Organization (TKO). The department was tasked with checking the manufactured products and associated components. The archived in-house reports provide a good insight into the quality issues of the color film materials from Wolfen. On the one hand, the investigations of the <scientific research department> (Wissenschaftliche Forschungsabteilung) and the TKO were based on the analyses of domestic materials and on the other hand on references from outside. **(→21)**

Accordingly, the assessment of quality was dependent on observation and comparison. In the strictest secrecy, investigations were carried out behind the so-called iron curtain at regular intervals. The department <analytics> focused on the "Fremdmaterialprüfung",

foreign film inspection, the examination and evaluation of film stocks from other countries. **(→22)** Members of the department traveled abroad or received test films from their on-site representatives, who then **(→23)** analyzed them in their research laboratories to identify the **(→24)** components used.

(→25) This is an example of a report from a business trip to Hungary. The crew brought film stocks from ORWO and Kodak to compare their compatibility with different print materials.

(→26) This is another example of a detailed description of an analysis method scientists from Wolfen used to understand the material composition of unknown film stocks (layer extraction).

(→27) That means that they had to follow several steps before even knowing what the components of their examined example were. This was followed by a thorough quality **(→28)** comparison between the competing products and the in-house film material.

(→29) The following evaluation was done according to **(→30)** qualitative and economic criteria.

(→31) The scientists didn't only compare single raw films but also entire series. This proves the systematic approach of their observation cycle.

(→32) At this point, for the sake of overall product compatibility, one would have had to **(→33)** adapt to the most common standard. **(→34)**

Usually this standard has been determined by Kodak, whether in the development of color masking, the development process or the color coupling system. In Wolfen, however, the quality assessment of foreign materials was usually confronted with a dilemma. On the one hand, it recognized the qualitative superiority of competitors such as Kodak, on the other hand, the new standards could not be so easily integrated into the ideologically controlled planned economy. This led to a lot of frustration, finally. Nevertheless, **(→35)** they continued the cycle of observation, exchange and slight adaptations from time to time. But with each new investigation, Wolfen fell more and more behind the international standard, partly due to stagnant or worsening working conditions. Also the former research director Herward Pietsch blamed the limiting conditions ("Randbedingungen") for falling behind the competition. He formulated his indirect criticism of the political leaders of the GDR in 1970s as follows, I quote **(→36)**:

"Our people are not more stupid than the others. They can do their work at least as well as them, we have a good school system. That is still my opinion. We have excellent colleges that are well equipped, which also produce sufficiently well-educated academics; and we have a good basic research. So there is the question: Why and for what reason do we have such problems? It cannot be up to the individuals! […] So it's just about limiting conditions that make it easier for others." (End of quote)

The example of Agfacolor is particularly suitable for an investigation of quality issues. The positive connotation of the early years was replaced by an ever louder disapproval of its quality during the Cold War period. Due to the political situation, Wolfen's economic conditions after the transition to the Soviet occupation zone in 1945 were closely tied to the centralized requirements of the socialist regime and intensified in 1950 with the entry of the GDR into the Council for Mutual Economic Assistance (Rat für gegenseitige Wirtschaftshilfe - RGW). What quality and quantity could be produced at that time depended strongly on external factors such as politically motivated economic relations, which were at times attempted to conceal or calculated euphemistically.

Also in the Czechoslovak Socialist Republic (CSSR), the more easily available Agfacolor resp. Orwocolor from the GDR was compared with products from the non-socialist West. The Czech film scholar and restorer Anna Batistova referred to the factors for quality comparison as follows, I quote **(→37)**:

"[The] quality of the eastern Agfa stock was low. In various tests conducted in the period, Czechoslovak technicians found the definition of Agfacolor positive materials 50 per cent lower than that of Eastmancolor, while the sensitivity of the emulsion was uneven, sometimes in the same reel. Up to 10 per cent of the Agfacolor material was sent back to Wolfen as faulty every year. Reports from the period comment on the low quality of the colour stock causing problems during shooting and processing (Anon. 1955). Proof of this is evident in the poor colour saturation in scenes with lower intensity of light (for example night scenes) and changes of colour during dissolves which are visible on the surviving prints and recently released digital copies of some films."

In addition to the technical flaws which manifested themselves on an aesthetic level - such as the uneven application of emulsion – other problems for Wolfen were the unreliable supply agreements and the lack of communication between the socialist trading partners, as

the Czech film restorer and curator Tereza Frodlova has highlighted. Nevertheless, in many cases, the aesthetic properties of color film materials are primarily equated with quality.

However, the production of chromogenic color film stock was not only quality driven. What I mean by this is that economic factors were adapted to socio-political as well as cultural standards and needs. Furthermore, those standards lead to transnational exchanges of products and knowledge about it.

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Another example for this is Wolfen's trading deal with India.

Thanks to a bilateral trade agreement, in particular the Orwocolor films have become deeply intertwined with the Indian film history and have influenced a whole generation of filmmakers working with the cheaper material. Günther Gromke, an employee of the Technical Customer Service working for ORWO in India at the time, described in his own words what kind of conditions their international collaboration was built on, I quote **(→39)**:

"There was a bilateral agreement between India and the GDR. It was not settled in foreign currency, but it was mutually settled. That was a barter, if you like. So we bought coffee, tea, bone meal, shellac and such things, largely natural products, and we sold [our raw film stocks] too and that was set off against each other. In this respect, this was also very attractive for the Indians, the Indians as well lacked foreign exchange at that time."

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Gromke explains the difference between ORWO and other (better) color film stocks with the comparison of a fan and an air condition. He says, I quote **(→41)**:

"It had to work with the material, of course. But it didn't have to be the very best. And that's the way we sold. As our representative in Bombay used to say: 'There are people who sell air conditioners, and there are people who sell this fan that hangs in the living room. Of course an air conditioner is better, it is also more expensive, but a lot of people get along with the fan. And we sell fans.'" (End of quote)

And ORWO was focused on the production of mass-compatible materials to cope with the demands, not with the highest quality standard. That's why they (metaphorically speaking) produced fans instead of air conditions. The Indians however benefited from ORWO's need

for favorable trade-offs and thus were able to build their own film production on the cheap color film stock, release prints in particular.

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You saw that the most common or widespread color film stock in one country was not necessarily associated with the best quality but also linked to reliable trading deals with a company such as ORWO, which was little mentioned in international monographs, f.ex. because their film stocks did not correspond to the Western standard.

What I demonstrated in my paper today is that the history of the chromogenic monopack is a history of constant transnational exchange of knowledge and products. The people and companies involved were sometimes only a few and sometimes they were extensively organized. However, the relations were always there. The shutdown of the GDR brought many sources to light who have been kept in secrecy before. This legacy is by far not complete but it offers a heterogenous picture of the official and unofficial proceedings behind the so-called Iron curtain that suddenly becomes a semi-transparent one.

(→43) Thank you for your attention!